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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/614,592	07/12/2000	Toshifumi Sato	Q60082	2296

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Sughrue Mion Zinn MacPeak & Seas
2100 Pennsylvania Avenue NW
Washington, DC 20037-3202

EXAMINER

FAN, CHIEH M

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 10/01/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/614,592

Applicant(s)

SATO, TOSHIFUMI

Examiner

Chieh M Fan

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 7-10 is/are rejected.
- 7) ☒ Claim(s) 2-6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 July 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,4,5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: "Nb correlation signals" in lines 8, 11 and 13 of page 19 should be changed to --- Na correlation signals ---, and "207_{Na}" in line 23 of page 19 should be changed to --- 207_{Nb} - --.

Appropriate correction is required.

Claim Objections

2. Claims 1-10 are objected to because of the following informalities: the examiner suggests changing the limitation "the weight and averaged correlation signals" in line 19 of claim 1 to --- the averaged, weighted and added correlation signals ---. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 7-10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

According to Figs. 2 and 4, it appears that the specification only teaches means for averaging the weighted and added correlation signals (205 in Fig. 2 or 4). The drawings never show means for averaging the power of said correlated signals. It is not clear which element shown in Fig. 2 or 4 is referred to the claimed "means for averaging the power of said correlated signals".

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sawahashi et al. (U.S. Patent No. 6,069,912, "Sawahashi" hereinafter).

Sawahashi discloses a path search circuit in a CDMA cellular system, comprising:

an antenna having a plurality of elements (901A-901C in Fig. 9);

a plurality of radio receivers for frequency-converting radio frequency signals received respectively by the elements of the antenna into respective baseband signals (902A in Fig. 9, note that the RF stage includes a plurality of RF elements, see 102A-102D in Fig. 1 or 502 in Fig. 5);

a plurality of A/D converters for converting the respective baseband signals into digital data (902A in Fig. 9, note that the RF stage includes a plurality of A/D converters, see 103A-103D in Fig. 1 or 503 in Fig. 5);

a plurality of correlation processors for calculating cross correlations between the digital data converted from the baseband signals and a signal known at a reception side, and outputting respective correlation signals (903A-903C in Fig. 9);

a weighted-mean-value processor for weighting and adding the correlation signals output from said correlation processors based on indicated weighting coefficients (904A-904C in Fig. 9);

a correlation peak detector for detecting at least one peak from the weighted and averaged correlation signals output as delay profiles from said weighted-mean-value processor, and outputting a reception level and reception timing corresponding to the detected peak as a reception level and reception timing of a reception path (906 in Fig. 9, note that the phase fluctuation estimator 906 inherent includes a peak detector because it is known that the received phase is determined by the peak of correlation);
and

a weighting controller for controlling said weighting coefficients to determine a directivity of said antenna and generating a plurality of weighting coefficients to establish a plurality of general antenna directivities for dividing a sector where a mobile terminal with which to communicate is present, when a communication session starts (912 and 913 in Fig. 9).

The embodiment shown in Fig. 9 of Sawahashi does not show an averaging element to average the weighted and added correlation signals. However, Sawahashi also teaches that, in a multipath environment, the weighted and added correlation signals for each path are averaged (508 in Fig. 5) before the weighted and added correlation signals are combined in a rake combiner (511 in Fig. 5) in order to improve the signal quality and improve the detection accuracy. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to average the weighted and added correlation signals in the embodiment shown in Fig. 9 of Sawahashi in a multipath environment, so as to improve the signal quality and improve the detection accuracy.

7. Claims 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawahashi as applied to claim 1 above, and further in view of Dobbins et al. (U.S. Patent No. 5,730,272).

As applied to claim 1 above, Sawahashi teaches the claimed invention but fails to teach a moving average method (claim 7) or an exponentially weighted mean method (claim 9). However, both moving average and exponentially weighted mean methods

known methods for calculating average in the art. Dobbins et al. teaches that the exponentially weighted moving average also has the advantage of ease of microprocessor implementation since the exponentially weighted moving average can be easily calculated (col. 15, lines 38-40). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to calculate average using exponentially weighted moving average method, since the exponentially weighted moving average can be easily calculated and be easily implemented in a microprocessor.

Allowable Subject Matter

8. Claims 2-6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and to overcome the claim objection in Paragraph 2 of this Office Action.

Claims 2, 5, and 6 are allowable over the prior art of record because the prior art of record does not teach or suggest that the weighted-mean-value processor comprises "processing means for multiplying the correlation signals read from said first memory by the weighting coefficients indicated by said weighting controller, adding the multiplied correlation signals into a sum signal, determining the power of the sum signal, updating the interim calculated results stored in said second memories based on the determined power, averaging the updated interim calculated results for a predetermined number of

times to obtain weighted means of correlation values, and outputting the obtained weighted means as delay profiles.”

Claim 4 is allowable over the prior art of record because the prior art of record does not teach or suggest that the “weighting controller comprises means for generating combinations of weighting coefficients for establishing an antenna directivity in a plurality of directions in which a party to communicate with is possibly present, when the communication session starts, and reducing the number of combinations to be generated during the communication session so as to be smaller than the number of combinations to be generated when the communication session starts.”

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Maruta et al. (U.S. Patent No. 6,205,166), Shoki et al. (U.S. Patent No. 6,087,986), Kinoshita et al. (U.S. Patent No. 6,128,333), Sato (5,982,763) are the corresponding US patents of the Japanese references cited in IDS filed 7/12/00. Raphaeli (U.S. Patent No. 6,064,695) teaches interpolating the output of a correlator. Ide et al. (U.S. Patent No. 6,498,804) teaches a method for directional reception.

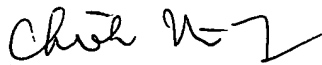
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M Fan whose telephone number is (703) 305-

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0198. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM,
Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (703) 305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.


Chieh M Fan
Examiner
Art Unit 2634

cmf
September 21, 2003